

Cook County Land Exchange Project

Gunflint and Tofte Ranger Districts

Superior National Forest

Biological Evaluation

Regional Forester Sensitive Species

Terrestrial Wildlife

Biological Evaluation

Prepared by: /s/ David D. Grandmaison
Wildlife Biologist

Date: November 19, 2013

INTRODUCTION

This Biological Evaluation (BE) assesses the potential effects of the proposed Cook County Land Exchange Project on terrestrial wildlife listed as Region 9 Regional Forester Sensitive Species (*hereafter* RFSS - U.S. Department of Agriculture (USDA) Forest Service Manual sections 2670.3, 2670.5 (3), 2672.4). The species evaluated in this report include all terrestrial animal species on the current Region 9 sensitive species list (USDA Forest Service 2011). Sensitive aquatic animals and sensitive plants are covered in separate biological evaluations for this project. The Canada lynx (federally threatened) is covered in a separate Biological Assessment.

The BE is the tool used to consider the effects of a project on RFSS. Determinations in a BE address the question of how project actions and/or alternatives affect species viability at the local level, and resulting implications for species viability and distribution throughout their range. The analysis of effects results in one of the following determinations:

- *No impacts* – used when no effect is expected.
- *Beneficial effects* – used when the proposed alternative is expected to be wholly beneficial without potential negative impacts.
- *May impact individuals but is not likely to cause a trend to federal listing or loss of viability* – used when effects are expected to be insignificant (unmeasurable) or discountable (extremely unlikely).
- *Likely to result in a trend to federal listing or loss of viability* – used when effects are expected to be detrimental and substantial.

The management objective is to maintain a viable and well-distributed representation of all native species that occur on the Superior National Forest (National Forest Management Act Regulation 219.19 and 219.26, Secretary of Agriculture Regulation 9500-4, USDA Forest Service Manual 2670.12, 2670.22, and 2670.32, and Forest Plan p. 3-4). Working definitions for “viability” and “well-distributed” are taken from Iverson and René (1997):

- *Viability* – the likelihood that habitat conditions will support persistent and well-distributed populations over time.
- *Well-distributed* – species and habitat distribution are based on the current and historic natural distribution and dispersal capabilities of individual species, and dispersal includes the concepts of metapopulation dynamics and gene flow.

This BE tiers to the Superior National Forest’s Programmatic Biological Evaluation for the 2004 Forest Plan Revision (USDA Forest Service 2004a) and provides information regarding site-specific effects that the land exchange project may have on RFSS.

PROJECT DESCRIPTION

The USDA Forest Service proposes to exchange up to 1,580 acres of National Forest System land to Cook County, MN in exchange for 1,910 acres owned by the State of Minnesota and

administered by Cook County within the Boundary Waters Canoe Area Wilderness (BWCAW). The Cook County Land Exchange Project Environmental Analysis (EA; USDA Forest Service 2013) describes the proposed action in detail and provides information on the parcels included in the exchange (EA – Appendix E). The final acres to be exchanged would reflect balanced values and Forest Service parcels not needed to equal the value of Cook County lands would be dropped from the exchange.

Cook County parcels proposed for acquisition by the Forest Service are widely scattered, non-contiguous lands distributed throughout the Cook County portion of the BWCAW. Some of the parcels are accessible by water and portages while more remote parcels have no water, trail, or portage access. There are no structures or developed sites associated with any of the county parcels though some of the parcels could be accessed for recreation purposes. The EA includes detailed maps of Cook County parcels proposed for acquisition (EA – Appendix B).

Federal lands proposed for exchange with Cook County are distributed throughout Cook County within the Gunflint and Tofte Ranger Districts of the Superior National Forest. The Cook County Board of Supervisors passed a resolution on August 18, 2009 identifying county priorities for the proposed exchange. These priorities include: gravel supply, septage disposal, communication towers, fire halls, affordable housing, recreation opportunities, cemeteries, and economic development sites. The EA includes detailed maps of the Forest Service parcels proposed for exchange (EA – Appendix C).

The purpose of the proposed land exchange between Cook County and the Forest Service are twofold:

1. Acquisition and consolidation of National Forest System land within the BWCAW; and
2. Facilitating sustainable development for Cook County and achieving federal cost savings in special use administration resulting in more efficient land management.

Acquisition of County administered lands within the BWCAW is designated as a Priority 1 action where key tracts are needed to protect and manage administrative or congressionally designated unique, proposed, or recommended areas (Forest Plan, p. 2-51; G-LA-2). All of the Cook County parcels proposed for acquisition are desirable for inclusion in the National Forest System.

The decision for this project will include rationale on public interest based on public input, professional knowledge, and the information evaluated in the EA and included in the project record. The EA considers two alternatives (USDA Forest Service 2013):

1. Alternative 1 – No Action: there would be no changes to the existing land ownership of the parcels
2. Alternative 2 – Modified Proposed Action¹: approximately 1,910 acres of non-federal land would come into federal ownership and up to 1,580 acres of federal land would be conveyed to Cook County

¹ The Devil Track parcel (T62N, R1W, Section 21 SESW) was removed from the exchange proposal by the Cook County Board of Supervisors on February 12, 2013.

Under Alternative 2, County lands acquired by the Forest Service would be managed in accordance with Forest Plan direction for the BWCAW and applicable laws for wilderness management including the Wilderness Act of 1964 and the Boundary Waters Canoe Area Wilderness Act of 1978. During scoping for this project, the Forest Service consulted with Cook County to identify reasonably foreseeable uses of the federal lands proposed for exchange. Assumptions regarding the spatial extent of effect from those uses were made to quantify the number of acres that would be affected by the land exchange. Those assumptions are included in the project record (Project File: Assumptions.docx). The results of the foreseeable uses and effects assumptions for each parcel are listed in Table 1.

Table 1. Summary of reasonably foreseeable land use and estimated acres affected for federal parcels proposed for land exchange with Cook County.

Parcel No. ¹	TWP	RNG	SEC	Description	GLO Acres	Affected Acres ²	EA Map No. ³	Purpose
1 - PD	63N	1E	33	NWSE	40	+	F-6	Tower
2	65N	3W	30	SWSE	40	0	F-8	Tower
3	62N	2E	12	NWSW	40	0	F-2	Tower
4	61N	4W	34	NWSW	40	0	F-9	Tower
5	64N	1W	10	NWSW	40	0	F-7	Tower
6	64N	1W	9	NESE	40	5	F-7	Fire Hall
7	62N	1W	21	NWSE	40	40	F-5	Gravel
8	62N	1W	21	NESE	40	40	F-5	Gravel
9	62N	1W	21	SWNE	40	40	F-5	Gravel
10	62N	1W	21	SENE	40	40	F-5	Gravel
11	62N	1E	30	SESE	40	5	F-4	Fire Hall
12	59N	4W	29	SWNE	40	40	F-10	Misc
13	59N	4W	29	NWSE	27	27	F-10	Misc
14	65N	4W	26	NESW	40	40	F-8	Gravel
15	65N	4W	26	SENE	40	40	F-8	Gravel
16	62N	1W	15	SWSW	40	40	F-5	Gravel
17	62N	1W	15	SESW	40	40	F-5	Gravel
18	62N	1E	24	NWSE	40	40	F-4	Gravel/Septage
19	62N	1E	24	NWSW	40	40	F-4	Gravel/Septage
20	62N	1E	24	SENE	40	40	F-4	Gravel/Septage
21	62N	1E	24	NENE	40	40	F-4	Gravel/Septage
22	62N	1E	24	NWNE	40	40	F-4	Gravel/Septage
23	62N	1E	24	NESW	40	40	F-4	Gravel/Septage
24	62N	1E	24	NENW	40	40	F-4	Gravel/Septage
25	62N	1E	24	SWNE	40	40	F-4	Gravel/Septage
26	62N	1E	24	NWNW	40	40	F-4	Gravel/Septage
27	62N	2E	24	SWNW	40	40	F-4	Gravel/Septage
28	62N	2E	24	NWSW	40	5	F-2	Fire Hall
29	64N	3E	4	G.L 15	34.89	5	F-1	Fire Hall
30	60N	3W	24	SWSW	40	40	F-11	Recreation
31	60N	3W	23	SWSE	40	40	F-11	Recreation
32	60N	3W	23	SESE	40	40	F-11	Recreation
33	62N	1E	31	G.L. 3	38.80	38.80	F-4	Recreation/Development
34	62N	1E	31	NENW	40	40	F-4	Recreation/Development
35	61N	2E	9	NENE	40	40	F-3	Gravel

Parcel No. ¹	TWP	RNG	SEC	Description	GLO Acres	Affected Acres ²	EA Map No. ³	Purpose
36	61N	2E	9	NWNE	40	40	F-3	Gravel
37	61N	2E	9	SENE	40	40	F-3	Gravel
38	61N	2E	9	SWNE	40	40	F-3	Gravel
39	62N	1E	31	NWNE	40	40	F-4	Recreation/Development
40	65N	4W	26	SWNW	40	40	F-8	
Total Acres					1,580.69	1,193.80		
¹ Arranged in decreasing priority for acquisition.								
² Affected acres based on assumptions included in project record (See Table 2 of this document).								
³ Parcel maps are included in the EA - Appendix C.								

ANALYSIS AREA AND METHODS

The analysis for the Cook County Land Exchange BE applied a coarse- and fine-filter approach to evaluate effects to RFSS; similar to the process used in the Forest Plan BE (USDA 2004a). The coarse-filter approach used broad-scale measures of habitat called Management Indicator Habitats (MIH; USDA 2004b). MIH designations represent forest cover type and age class distribution. The use of MIH as an approximation of the amount of potentially suitable habitat for RFSS acknowledges that habitat for each species is a unique combination of vegetation and other features that are often not readily detected by forest type and age class alone (USDA 2004b). Spatial and temporal changes to forest stands are tracked by the Forest Service using a combination of project-level surveys and geographic information system modeling on an annual basis (USDA 2004b). MIH data for this analysis were based on the most up-to-date data available (2012 Model Run: mih_ext_2012.shp) and included vegetation management prescriptions from recent decisions for the following management areas (MAs): Devil Trout Project (USDA 2006), Mid-Temperance (USDA 2007), and Twins Project (USDA 2010).

The fine-filter approach (i.e., site-level) addressed species needs by managing high-quality habitats with potential or known occupancy by sensitive species. While no specific sensitive terrestrial wildlife surveys were conducted for this BE, surveys were conducted for recently completed vegetation management projects which included parts of the project area: Devil Trout Project (USDA 2006), Mid-Temperance (USDA 2007), and Twins Project (USDA 2010). A fourth vegetation management project, the North Shore Project, is currently in planning and analysis. In addition, wildlife occurrence record databases for RFSS were consulted to identify site-specific conflicts that might be present within or adjacent to federal parcels proposed for exchange to Cook County.

Assumptions

While the future land use for federal parcels conveyed to Cook County are listed in the Cook County Land Exchange EA and this document (Table 1), detailed planning for these future uses on all parcels has not occurred. As a result, various assumptions were made to allow for a meaningful effects analysis (Table 2).

Table 2. Summary of assumptions used to estimate acres affected for federal parcels proposed for land exchange with Cook County.

Proposed Land Use	Assumptions
Tower	<p>Parcels with existing towers include federal parcels 2 – 5 (see Table 1). No change from current conditions is expected.</p> <p>One new tower is expected on the Pine Mountain site (federal parcel 1). The assumption is that 5 acres of upland forest types (MIH 1) will be affected.</p> <ul style="list-style-type: none"> Improvement would occur to an unclassified road, off of Forest Road 154 (Pine Mountain Road), constructed in accordance with the Forest Service “Special Uses Road Construction Stipulation Requirements”. This road will be dual purposes during the winter, allowing for snowmobile use. Plowing is not authorized without written permission from the Forest Service. Access road construction at this site may include: <ul style="list-style-type: none"> Clearing and tree/brush removal Improving road bed with approximately 1-foot of pit run granular fill material Additional fill, if required, in some locations (“fill” refers to ruts and puddles; filling of wetlands is not proposed) Installing culverts as required to maintain drainage Placing crushed aggregate surfacing as desired by user Buried electrical power lines may be installed adjacent to existing or improved road right-of-way. Construction of a 3-legged, 180-foot tall, steel radio tower that is dull grey galvanized in color to minimize visual impacts. The tower will contain no FCC markings, lights, or strobes. Construction of a concrete shelter measuring 12' x 30' x 10 located near tower to house communication equipment and back-up generator and a 1,000-gallon LP tank measuring 10' x 4' for storing generator fuel. Site surrounded a 7-foot chain link fence and 3 strands of barbed wire extending 1 foot above fence. Fenced area covered with a 4-ounce polyester filter fabric to retard weed growth.
Fire Hall	There are 3 existing fire halls and 1 new fire hall proposed. The assumption is that 5 acres of upland forest types (MIH 1) will be affected on each parcel.
Gravel	Parcels with planned gravel resource development assume that the entire parcel is affected.
Septage	Parcels with planned septage disposal assume that the entire parcel is affected.
Recreation	Parcels with planned recreation development assume that the entire parcel is affected.
Development	Parcels with planned development assume that the entire parcel is affected.

Analysis Area

The geographic boundary for evaluating direct, indirect, and cumulative effects of the Cook County Land Exchange Project varied among RFSS. For northern goshawk (*Accipiter gentilis*) and gray wolf (*Canis lupis*), the analysis area was defined by the six MAs within which the federal parcels are located: Upper Gunflint, North Greenwood, Devil Trout, Mid-Temperance, Twins, and North Shore MAs. For all other RFSS, effects were analyzed within a 1-mile buffer surrounding and encompassing the parcels proposed for exchange to the County – an area that incorporated any known locations and habitats potentially impacted by the land exchange and subsequent land use. Cook County parcels acquired by the Forest Service in the land exchange were not considered in this analysis because no management changes would occur with changes in ownership. Direct and indirect effects considered effects on federally owned properties while the cumulative effects analysis area included all ownerships.

Analysis Timeframe

The analysis timeframe for direct, indirect, and cumulative effects is between years 2013 and 2020. This seven-year span is an appropriate timeframe because development of parcels after the exchange and currently proposed vegetation management actions is assumed to occur within this period. In addition, all of the current acres of young age class forest would move out of that age class during this time. An analysis year of 2020 provides an estimate of any effects of parcel development, along with the potential addition of vegetation management effects as well as natural forest succession following implementation.

AFFECTED SPECIES

Existing reports and databases developed by Gunflint and Tofte District biologists and the Minnesota Department of Natural Resources Natural Heritage Program database of element occurrences (MNDNR 2012) were reviewed for species occurrence records. These data, along with MIH data modeled for the year 2012 were examined using a geographic information system

(GIS) to determine if suitable habitat or known occurrences were documented for the analysis area defined above. This analysis is summarized in Appendix A. Only those species known to occur or likely to occur within the analysis area and having suitable habitat in the area were analyzed in detail in this document. For all other RFSS, **no impacts** are expected.

In addition, a review of the Minnesota Department of Natural Resources Natural Heritage Program database of element occurrences (MNDNR 2012) showed that no records of RFSS with State threatened, endangered or special concern status were documented on any of the federal parcels proposed for exchange to Cook County.

ENVIRONMENTAL CONSEQUENCES

This BE tiers to the Regional Forester Sensitive Animals and Plants BE of the Forest Plan Revision for the Chippewa and Superior National Forests (USDA Forest Service 2004a) for the purpose of addressing potential impacts associated with activities and programs that could result in physical ground disturbance, habitat alteration, or disturbance from human access. Quantified impacts to habitat are based on assumptions related to potential future land use identified by Cook County (Tables 1 and 2). Impacts to MIH are scale dependent in that larger analysis areas yield smaller absolute values of the proportion or percent of habitat affected by the proposed action. Therefore, it is important to keep in mind that analysis areas defined in this analysis were based on the RFSS species evaluated. Gray wolves and northern goshawk, for example, were evaluated at a larger spatial scale than the remaining RFSS (see *Analysis Area* above).

Gray Wolf (*Canis lupus*): The Superior National Forest does not maintain forest-wide location records for gray wolves (K. Kirschbaum, Kawishiwi District Wildlife Biologist, personal communication; Project File: Kirschbaum_email.docx) although a few records do exist for historic wolf dens and rendezvous sites (source: XYEZ_Incidental_Observations.shp). A rendezvous site was identified 0.12 miles from the eastern boundary of parcel 15 in 2010. In 2012, a den site was detected 0.03 miles from the southern boundary of parcel 40.

Wolf habitat is characterized by low human population and road density, sufficient prey density, and a variety of habitat types that support prey species (Mech 1970, Fuller 1989, Mladenoff et al. 1995, 1999). Prey species such as moose (*Alces alces*), deer (*Odocoileus virginianus*), and snowshoe hare (*Lepus americanus*) tend to forage in regenerating upland forest and utilize conifer stands as thermal cover while riparian aspen forest is important for beaver (*Castor canadensis*). In addition, roads influence wolf distribution and high road density may deter dispersal (Mech et al. 1988). For the purpose of analysis, impacts to upland deciduous (MIH 2) and coniferous (MIH 5) forest were evaluated along with potential impacts from additional roads needed for infrastructure development and facility operations.

Alternative 1

Alternative 1 is likely to have **no impacts** to gray wolves because the proposed land exchange would not occur. Forest Service lands would continue to be managed under Forest Plan direction to maintain, protect, or improve habitat for all sensitive species (Forest Plan, p. 2-31; O-WL-18) and to ensure that management would not lead to a trend toward federal listing (Forest Plan, p. 2-32; S-WL-5). Changes to habitat would continue through forest succession and management

prescriptions guided by the Forest Plan and the overall amount of wolf habitat in the analysis would not appreciably change by 2020.

Alternative 2

Three parcels proposed for conveyance to, and identified as sources of gravel for, Cook County have potential to impact gray wolves (parcels 14, 15, and 40) given their proximity to a documented den site and rendezvous location (source: XYEZ_Incidental_Observations_shp). While neither site is located within the footprint of these parcels, human disturbance and habitat modification have the potential to impact future use of these sites by wolves. While the possibility exists that the den site could be used in multiple years, most dens are used during a single year (L. Mech, U.S. Geological Survey Senior Scientist, personal communication; Project File: Mech_email.docx). Furthermore, wolves can be tolerant to human activity near den sites and will habituate to anthropogenic disturbance (Ballard et al. 1987, Thiel et al. 1998).

Suitable wolf habitat is well dispersed throughout the analysis area and vegetation management projects in the applicable MAs will not appreciably change the amount of available wolf habitat. Within the analysis area, the amount of suitable wolf habitat is estimated at 152,927.83 acres (Project File: CookCountyLE_BE_DataAnalysis.xlsx). Land use plans for parcels conveyed to Cook County would amount to 1,073.06 acres of impact (0.70% of available suitable habitat). Approximately 920 acres of MIH 1 (which accounts for both MIH 2 and MIH 5) may be altered as a result of gravel extraction (Table 1). As gravel resources are depleted on these parcels, the parcels will be reclaimed and returned to forested habitat. Once reclaimed, the overall impact to wolf habitat will decrease.

No new roads were identified for creation as a result of the proposed action and road improvement for the Pine Mountain radio tower parcel was incorporated into the overall tabulation of acres affected. There is potential for traffic volume to increase along existing roadways that provide access to parcels proposed for conveyance to Cook County although any increase in traffic is expected to be negligible. A recent analysis of the forest-wide travel management plan (USDA Forest Service 2008) which guides travel management on the Superior National Forest analyzed the impacts of the plan to gray wolves and determined that the plan may impact wolves but is not likely to cause a trend to federal listing or loss of viability. Road management on Forest Service properties adjacent to the parcels conveyed to Cook County will be managed under this framework.

Cumulative effects could occur as a result of future federal and non-federal actions that occur within the analysis area. Parcelization and development of non-federal forestlands may result in further fragmentation of, and human access to, wolf habitat. Road development on State, county, and private lands would continue under either alternative as would wolf mortality associated with vehicle collision, shooting, and trapping. Based on increasing wolf populations over the past two decades, cumulative impacts to wolves are not expected to have major impacts on wolf populations (USDA 2004b).

Therefore, Alternative 2 ***may impact individuals but is not likely to cause a trend to federal listing or loss of viability*** for the gray wolf on the Superior National Forest.

Northern Goshawk (*Accipiter gentilis*): Surveys within historic goshawk territories and suitable habitat have been conducted in several MAs over the past decade and the Superior National Forest contributes to the Minnesota Department of Natural Resources statewide database of goshawk territory and nest locations (goshawkterritories2012.shp). Based on these data and records in the Minnesota Department of Natural Resources Natural Heritage Program database (MNDNR 2012), no goshawk nests or territories are known to occur in any of the federal parcels proposed for exchange to Cook County.

Suitable goshawk habitat is described as upland forest consisting of mature deciduous or mixed deciduous and coniferous stands in contiguous patches intermixed with younger forests and openings that support prey populations (Reynolds et al. 1992, Graham et al. 1994, Squires and Reynolds 1997). For this analysis, goshawk habitat is represented by mature upland forest (MIH 1) patches greater than 100 acres in size.

Alternative 1

Alternative 1 is likely to have ***no impacts*** to northern goshawk because the proposed land exchange would not occur. Forest Service lands would continue to be managed under Forest Plan direction to maintain, protect, or improve habitat for all sensitive species (Forest Plan, p. 2-31; O-WL-18) and to ensure that management would not lead to a trend toward federal listing (Forest Plan, p. 2-32; S-WL-5). Changes to habitat would continue through forest succession and management prescriptions guided by the Forest Plan and the overall amount of goshawk habitat in the analysis would increase by 2020.

Alternative 2

Only two parcels proposed for conveyance to Cook County intersect suitable goshawk habitat as defined in this analysis (i.e., parcels 3 and 28; Table 1). Parcel 3 does not have any anticipated changes from current conditions and will not measurably affect goshawk habitat. Parcel 28 was identified as the future site for a new fire hall with an estimated impact to 5 acres of mature MIH 1 from the construction of buildings, a parking lot, and an access road. Permanent loss of these 5 acres would reduce a contiguous patch of suitable goshawk habitat from 100.05 acres to approximately 95.05 acres. While there is no known goshawk occurrence within this patch, there is the potential that future fire hall operations could inhibit nesting in adjacent habitat due to goshawk sensitivity to human activity (Squires and Reynolds 1997).

The availability of suitable goshawk habitat within the analysis area (11,135.65 acres; Project File: CookCountyLE_BE_DataAnalysis.xlsx) should provide adequate alternative territory opportunities for local goshawk. Cumulative effects of vegetation management within the analysis area indicate that goshawk habitat will increase to 11,295.90 acres by 2020 (Project File: CookCountyLE_BE_DataAnalysis.xlsx). Given Forest Service management of adjacent goshawk habitat, the likelihood of appreciable direct, indirect, or cumulative effects to northern goshawk is low.

Based on this assessment, Alternative 2 ***may impact individuals but is not likely to cause a trend to federal listing or loss of viability*** for the northern goshawk on the Superior National Forest.

Other RFSS Species: Examination of the Minnesota Department of Natural Resources Natural Heritage Program database (MNDNR 2012) and wildlife location databases compiled by the Superior National Forest indicates that no records of RFSS were documented within any of the federal parcels proposed for exchange to Cook County. However, suitable habitat defined by MIH categories for 13 RFSS species exists within the analysis area that surrounds and encompasses the federal parcels that would be conveyed to Cook County under the proposed action (Table 3; Appendix A).

Lake Superior's North Shore is an important feature for avian migration; the lake acts as a barrier to migration and prominent ridgelines serve to funnel migrants along the lakeshore towards the City of Duluth, Minnesota (Hofslund 1966, Bardon 2012, Evans et al. 2012, Seeland et al. 2012). Recent studies have identified that the number of migrants (both raptors and non-raptors) is highest near the shoreline and decreases with increasing distance from Lake Superior (Peterson and Niemi 2011).

Raptors rely on updrafts that form along ridgelines as a means of conserving energy during migratory movements (Hofslund 1966, Mueller and Berger 1967). As a result, raptor counts vary greatly along the shoreline and are influenced by the location of ridges (Seeland et al. 2012). Accipiters (e.g., northern goshawk, sharp-shinned hawk [*Accipiter striatus*], Cooper's hawk [*Accipiter cooperii*], etc.) tend to utilize airspace from the canopy to 328 feet above while soaring raptors (e.g., golden eagles [*Aquila chrysaetos*], bald eagles, and red-tailed hawks [*Buteo jamaicensis*]) generally travel at higher altitudes (Seeland et al. 2012). Other RFSS raptors identified during migratory counts along the North Shore and at Duluth's Hawk Ridge include boreal owls and great gray owls (Evans et al. 2012).

Migrating passerines display a similar pattern of migration along the North Shore of Lake Superior but tend to utilize airspace within 328 feet of the forest canopy (Peterson and Niemi 2011). RFSS identified in North Shore migration studies and bird counts at Duluth's Hawk Ridge include American three-toed woodpeckers, Connecticut warblers, and olive-sided flycatchers (Peterson and Niemi 2011, Bardon 2012). Researchers at the University of Minnesota's Natural Resources Research Institute estimated that 80% of non-raptor migrants use airspace within 4.97 miles of the shoreline (A. Peterson, Research Assistant, Conservation Biology Graduate Program, personal communication).

Alternative 1

Alternative 1 is likely to have ***no impacts*** to the remaining RFSS species (Appendix A) because the proposed land exchange would not occur. Forest Service lands would continue to be managed under Forest Plan direction to maintain, protect, or improve habitat for all sensitive species (Forest Plan, p. 2-31; O-WL-18) and to ensure that management would not lead to a trend toward federal listing (Forest Plan, p. 2-32; S-WL-5). Changes to habitat would continue through forest succession and management prescriptions guided by the Forest Plan.

Alternative 2

Under Alternative 2 (Modified Proposed Alternative), the Superior National Forest would convey up to 1,580 acres of federal land to Cook County. Current land use (e.g., locations of Mid Trail fire hall and existing radio towers, access roads, etc.) would continue with some additional

development described in Tables 1 and 2. **No impacts** to bald eagles (*Haliaeetus leucocephalus*) are expected based on a lack of appropriate nesting habitat within any of the parcels (i.e., mature red and white pine forest; Table 3). Should future eagle nests be found on parcels acquired by Cook County, protections under the Bald and Golden Eagle Protection Act will apply regardless of land ownership status.

Table 3. Habitat conditions (acres) and impact of the proposed action to suitable habitat for 13 RFSS species. The number of acres of suitable habitat and impacted habitat were calculated within an analysis area defined by a 1-mile radius buffer around federal parcels proposed for exchange with Cook County. Habitat definitions for each species are included in Appendix A.

Species	Habitat Conditions (acres)					
	Existing Condition (2012)	Proposed Action	% Change	Condition (2020)	Proposed Action	% Change
Little Brown Myotis	13,626.00	1,073.06	7.88%	22,408.06	1,073.06	4.79%
Northern Myotis	13,626.00	1,073.06	7.88%	22,408.06	1,073.06	4.79%
Tri-colored Bat	13,626.00	1,073.06	7.88%	22,408.06	1,073.06	4.79%
Heather Vole	796.68	45.01	5.65%	1,197.99	45.01	3.76%
Bald Eagle	552.91	0.00	0.00%	628.16	0.00	0.00%
Boreal Owl	8,596.53	329.67	8.42%	8,536.04	329.67	3.86%
Great Gray Owl	10,609.83	724.07	0.33%	22,416.96	724.07	3.23%
Olive-sided Flycatcher	2,317.89	35.45	1.53%	2,317.89	35.45	1.53%
Bay-breasted Warbler	2,905.75	68.04	2.34%	3,353.84	68.04	2.03%
Connecticut Warbler	2,384.84	60.72	2.55%	2,446.65	60.72	2.48%
American Three-toed Woodpecker	2,384.84	60.72	2.55%	2,446.65	60.72	2.48%
Alpine Tiaga Butterfly	2,317.89	35.45	1.53%	2,317.89	35.45	1.53%
Nabokov's Blue Butterfly	1,219.81	45.01	3.69%	1,197.99	45.01	3.76%

Ground disturbance from future land uses under Alternative 2 could impact RFSS and RFSS habitat on adjacent federal lands (Table 3). Species primarily associated with upland habitats (e.g., heather vole [*Phenacomys ungava*], little brown myotis [*Myotis lucifugus*], northern myotis [*M. septentrionalis*], tri-colored bat [*Perimyotis subflavus*], and Nabokov's blue butterfly [*Lycaeides idas nabokovi*]) will experience the greatest impact from the proposed action given the dominance of upland forest types within the analysis area (Table 4). Species associated with lowland habitat (e.g., great gray owl [*Strix nebulosa*], boreal owl [*Aegolius funereus*], olive-sided flycatcher [*Contopus cooperi*], bay-breasted warbler [*Dendroica castanea*], Connecticut warbler [*Oporornis agilis*], American three-toed woodpecker [*Picoides tridactylus*], and Taiga alpine butterfly [*Erebia mancinus*]) will be less affected given a lower proportion of lowland conifer forest (MIH 9) in the analysis area and the fact that structural development on the parcels will take place primarily on upland sites.

Twenty-five of the federal parcels proposed for conveyance to Cook County are located within 4.97 miles of Lake Superior's shoreline. Land use proposed for these parcels (Table 1) may affect approximately 875.8 acres of habitat potentially used by migrating birds (Project File: CookCountyLE_BE_DataAnalysis.xlsx), including avian RFSS. The magnitude of the affect would vary by species; specific characteristics of stopover habitat are not yet defined.

Reductions in the amount of upland habitat within the analysis area would occur under either alternative. Disturbance to upland sites resulting from the proposed action should be ameliorated by the fact that suitable upland habitats of sufficient age class distribution will be available across the MAs within which this analysis was conducted (USDA 2006, 2007, 2010; Table 4). Similarly, development of non-federal forestland may further reduce the overall availability of upland habitat.

Despite anticipated habitat disturbance, there are no viability concerns for RFSS based on the potential impacts of the land use information provided by Cook County and the assumptions used in this analysis (Project File: Assumptions.docx). Suitable habitat for RFSS will remain well-distributed throughout the Superior National Forest and managed under Forest Plan guidance to maintain, protect, or improve habitat for all sensitive species (Forest Plan, p. 2-31; O-WL-18) and to ensure that management would not lead to a trend toward federal listing (Forest Plan, p. 2-32; S-WL-5).

This analysis indicates that for all RFSS with suitable habitat and the potential to occur within the analysis area, Alternative 2 *may impact individuals but is not likely to cause a trend to federal listing or loss of viability* on the Superior National Forest.

Table 4. Analysis of the number of acres of MIH impacted based on assumed future land use of federal parcels proposed for exchange with Cook County. Acres affected were calculated within an analysis area defined by a 1-mile radius buffer around federal parcels.

MIH ¹	MIH Description	Total MIH Acres ²	2012			2020		
			No Action ³	Proposed Action	% Change	No Action ³	Proposed Action	% Change
MIH 1	Upland Forest	152,600.00	13,626.00	12,552.94	7.88%	11,383.15	10,310.09	9.43%
MIH 2	Upland Deciduous Forest	99,012.00	10,514.89	9,774.29	7.04%	9,199.62	8,459.02	8.05%
MIH 3	Northern Hardwood and Oak Forest	11,155.00	2,048.11	2,030.39	0.87%	2,028.45	2,010.73	0.87%
MIH 4	Aspen-Birch and Mixed Aspen-Conifer Forest	87,857.00	8,466.78	7,743.90	8.54%	7,171.17	6,448.29	10.08%
MIH 5	Upland Conifer Forest	53,588.00	3,111.10	2,803.72	9.88%	2,183.53	1,876.15	14.08%
MIH 6	Upland Spruce-Fir Forest	36,308.00	1,237.50	1,094.32	11.57%	1,231.28	1,088.10	11.63%
MIH 7	Red and White Pine Forest	10,654.00	1,076.92	957.62	11.08%	628.16	508.86	18.99%
MIH 8	Jack Pine Forest	6,626.00	796.68	751.67	5.65%	324.09	279.08	13.89%
MIH 9	Lowland Black Spruce-Tamarack Forest	17,610.00	2,143.05	2,107.60	1.65%	2,131.46	2,096.01	1.66%
MIH 10	Upland Mature Riparian Forest	16,357.00	1,486.17	1,383.45	6.91%	1,337.88	1,235.16	7.68%
Non-Forest/Other	Non-Forested, Open, Shrublands, Developed	110,922.00	2,372.81	2,223.43	6.30%	2,372.81	2,223.43	6.30%

¹Management Indicator Habitat

²Combined acres within the six Management Areas where federal parcels are located: Upper Gunflint, North Greenwood, Devil Trout, Mid-Temperance, Twins, and North Shore.

³Existing (2012) and future (2020) acres within the 1-mile buffer analysis areas surrounding and containing the federal parcels proposed for conveyance to Cook County.

REFERENCES

- Ballard, W. B., J. S. Whitman, and C. L. Gardner. 1987. Ecology of an exploited wolf population in south-central Alaska. *Wildlife Monographs*, No. 98. 54 Pages.
- Bardon, K. J. 2012. Fall diurnal migration of passerines and other non-raptors at Hawk Ridge and Lake Superior, Duluth (2007-2011). *The Loon* 84:8-20.
- Evans, D. L., G. J. Niemi, and M. A. Etterson. 2012. Autumn raptor banding at Hawk Ridge, Duluth, Minnesota U.S.A., 1972-2009: an overview. *Journal of Raptor Research* 46:36-49.
- Fuller, T. K. 1989. Population dynamics of wolves in north-central Minnesota. *Wildlife Monographs* 105:3-41.
- Graham, R. T., R. T. Reynolds, M. H. Reiser, R. L. Bassett, and D. A. Boyce. 1994. Sustaining forest habitat for the northern goshawk: a question of scale. Pages 12-17 in W. M. Block, M. L. Morrison, and M. H. Reiser, editors. *The northern goshawk: ecology and management*. Cooper Ornithological Society Studies in Avian Biology, No. 16.
- Hofslund, P. B. 1966. Hawk migration over the western tip of Lake Superior. *Wilson Bulletin* 78:79-87.
- Iverson, G. C., and B. René. 1997. Conceptual approaches for maintaining well-distributed, viable wildlife populations: a resource assessment. Pages 1-23 in K. R. Julin, compiler. *Assessments of wildlife viability, old-growth timber volume estimates, forested wetlands, and slope stability*. USDA Forest Service General Technical Report PNW-GTR-392.
- Mech, L. D. 1970. *The wolf: the ecology and behavior of an endangered species*. University of Minnesota Press, Minneapolis, MN.
- Mech, L. D., S. H. Fritts, G. L. Radde, and W. J. Paul. 1988. Wolf distribution and road density in Minnesota. *Wildlife Society Bulletin* 16:85-87.
- Minnesota Department of Natural Resources Natural Heritage and Non-Game Research Program. 2012. *Rare features database: rare animal occurrences on the Superior National Forest*. Minnesota Department of Natural Resources, St. Paul, MN.
- Mladenoff, D. J., T. A. Sickley, and A. P. Wydeven. 1999. Predicting gray wolf landscape recolonization: logistic regression models vs. new field data. *Ecological Applications* 9:37-44.
- Mladenoff, D. J., T. A. Sickley, R. G. Haight, and A. P. Wydeven. 1995. A regional landscape analysis and prediction of favorable gray wolf habitat in the northern Great Lakes Region. *Conservation Biology* 9:279-294.

- Mueller, H. C., and D. D. Berger. 1967. Wind drift, leading lines, and diurnal migration. *Wilson Bulletin* 79:50-63.
- Peterson, A., and G. J. Niemi. 2011. Development of a comprehensive conservation strategy for the North Shore Highlands Region of Minnesota in the context of future wind power development. Final Report to the Minnesota Department of Natural Resources MN-T-34-R-1.
- Reynolds, R. T., R. T. Graham, M. H. Reiser, R. L. Bassett, P. L. Kennedy, D. A. Boyce, Jr., G. Goodwin, R. Smith, and E. L. Fisher. 1992. Management recommendations for the northern goshawk in the southwestern United States. USDA Forest Service General Technical Report RM-217.
- Seeland, H. M., G. J. Niemi, R. R. Regal, A. Peterson, and C. Lapin. 2012. Determination of raptor migratory patterns over a large landscape. *Journal of Raptor Research* 46:283-295.
- Squires, J. R. and R. T. Reynolds. 1997. Northern goshawk (*Accipiter gentilis*). In A. Poole and F. Gill, editors. *The birds of North America*, No. 298. The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, DC.
- Thiel, R. P., S. Merrill, and L. D. Mech. 1998. Tolerance by denning wolves, *Canis lupus*, to human disturbance. *Canadian Field-Naturalist* 122:340-342.
- USDA Forest Service. 2004a. Regional forester sensitive animals: biological evaluation for the Forest Plan revision, Chippewa and Superior National Forests. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, MN 55808.
- USDA Forest Service. 2004b. Forest Plan revision final environmental impact statement (FEIS). Superior National Forest, Duluth, MN. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, MN 55808.
- USDA Forest Service. 2006. Devil Trout Project biological evaluation. Superior National Forest, Duluth, MN. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, MN 55808.
- USDA Forest Service. 2007. Mid-Temperance reforestation project. Superior National Forest, Duluth, MN. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, MN 55808.
- USDA Forest Service. 2008. Forest-wide travel management project biological evaluation. Superior National Forest, Duluth, MN. On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, MN 55808.

USDA Forest Service. 2010. Twins Project biological evaluation. Superior National Forest, Duluth, MN.
On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, MN
55808.

USDA Forest Service. 2011. Revised regional forester sensitive species list for the Superior National
Forest.

USDA Forest Service. 2013. Cook County land exchange project. Superior National Forest, Duluth, MN.
On file with Forest Supervisor, Superior National Forest, 8901 Grand Ave. Place, Duluth, MN
55808.